A New Threat to American Hardwoods

Photo © by James E. Appleby, Univ. of Illinois Copyright

Diana Raichel, Fish and Wildlife Biologist, New Jersey Field Office

Of the estimated 50,000 exotic species introduced into the U.S. since colonial days, the Asian longhorned beetle (*Anoplophora glabripennis*) is one of the more spectacular. Also known as the starry sky beetle, this species is a large (1 to 1.23 inches long) insect with white markings on its shiny black body and unusually long antennae that are distinctly banded in black and white. This beetle attacks living trees and is regarded as a serious pest. In China, the beetle has caused tree mortality throughout vast areas. In the northeastern U.S., the insect seems to prefer maple species, which are common trees in forests and urban areas. According to the USDA's Animal and Plant Health Inspection Service, if this beetle spreads unchecked, it could cause billions of dollars in damage to ornamental trees and forests as well as to the lumber, maple syrup, and fall color tourism industries.

The Asian longhorned beetle yields one generation per year, and females lay approximately 35 eggs during their short life as an adult. During the summer, an adult female chews a groove through the bark of the tree then lays a single egg within the groove, which she then plugs with digested wood known as frass. Once the eggs hatch, the larvae feed within the tree, tunneling deeper as they grow.

The larvae overwinter deep within the heartwood and emerge in the spring as adults, leaving round exit holes a little smaller than a dime. If the tunneling larvae do not kill the tree outright, their damage exposes long limbs to breakage.

An Asian longhorned beetle chews a groove in tree bark, preparing to deposit an egg

Photo © by James E. Appleby, Univ. of Illinois Copyright

Left: A magnified view of an Asian longhorned beetle (*Anoplophora glabripennis*) feeding

Below: A cut-away on a slab of bark reveals an Asian longhorned beetle egg

Right: Asian longhorned beetles can inflict extensive damage to both the interior and the exterior of a tree

Photo © by James E. Appleby, Univ. of Illinois Copyright

Photo © by James E. Appleby, Univ. of Illinois Copyright

Photo © by James E. Appleby, Univ. of Illinois Copyright

Left: The Asian longhorned beetle can crawl quite swiftly along a tree trunk (note the round exit holes)

Below: The life cycle of the Asian longhorned beetle: egg, three larval stages, pupa, adult

Kenneth R. Law, USDA APHIS PPQ, www.invasive.org

In the United States, the Asian longhorned beetle was first noticed in New York City in 1996 by a Brooklyn resident who notified city officials that the Norway maples on his property were riddled with holes and infested with large beetles. Then other infestations were discovered in Islip and Amityville on Long Island, in Queens, and in Manhattan. In 1998, a Chicago resident collected a few beetles that had emerged from branches cut from a local tree. After obtaining information on this beetle from the internet, he notified Chicago officials. Three years later in 2001, a Hoboken, New Jersey man noticed the exotic-looking insect and after seeing a television broadcast about the destructive beetle, alerted State authorities; DNA analysis indicated a match to the New York population. Then, just in the last few months, four closely related infestations were found in suburban Toronto, Ontario. Thus, to date, three distinct North American populations are known to exist in New York/New Jersey, Chicago, and Toronto.

As of December 1998, the U.S. no longer accepts imports from China packed in untreated wooden materials. Fumigating or treating the wood with heat or preservatives has been effective at reducing the number of beetles entering the country, but unsuspected products such as bonsai trees and semi-artificial Christmas trees are still a potential portal of entry.

Efficient methods are evolving to detect beetles already present. In New York, the primary method of detecting the beetle was by examining trees from the ground looking for exit holes, frass, or the groove made by an egg-laying female. In Chicago, employing climbers or using bucket trucks to inspect the trees was more effective, but also more costly and time-consuming. Since this insect spends approximately 90% of its life as larvae hidden inside the tree, acoustic devices have been developed to pick up the "munching" sounds of the tunneling larvae with software isolating this noise from other environmental noises.

Because the insect larvae reside deep within the tree, removing, chipping, and burning the trees is the major means of eliminating infestations. Agriculture officials have removed and destroyed more than 8,900 infested trees in New York, New Jersey, and Illinois and replaced them with more than 7,570 non-host trees. Biological control is an option. Native enemies include predators, pathogens, and parisitoids. Insectivorous species such as woodpeckers have been encouraged in China. A form of control being developed in the U.S., based on a similar practice in China, utilizes the spores of a native fungus propagated on bands of a cloth-like medium that are placed on tree limbs to produce a deleterious effect on the beetle. Another current method showing promise is the use of the insecticide imidacloprid, which is either injected into the tree or placed in soil surrounding it.

We still have much to learn before we can eradicate the Asian longhorned beetle in the U.S. But as the New York/New Jersey and Chicago invasions illustrate, keeping tabs on this exotic species relies to a large degree on informed and concerned citizens. So keep an eye out for these six-legged invaders. You may be saving a tree—or possibly a forest.

Links to additional information:

http://www.aphis.usda.gov/lpa/issues/alb/alb.html

http://www.na.fs.fed.us/spfo/alb